

No. 632,693.

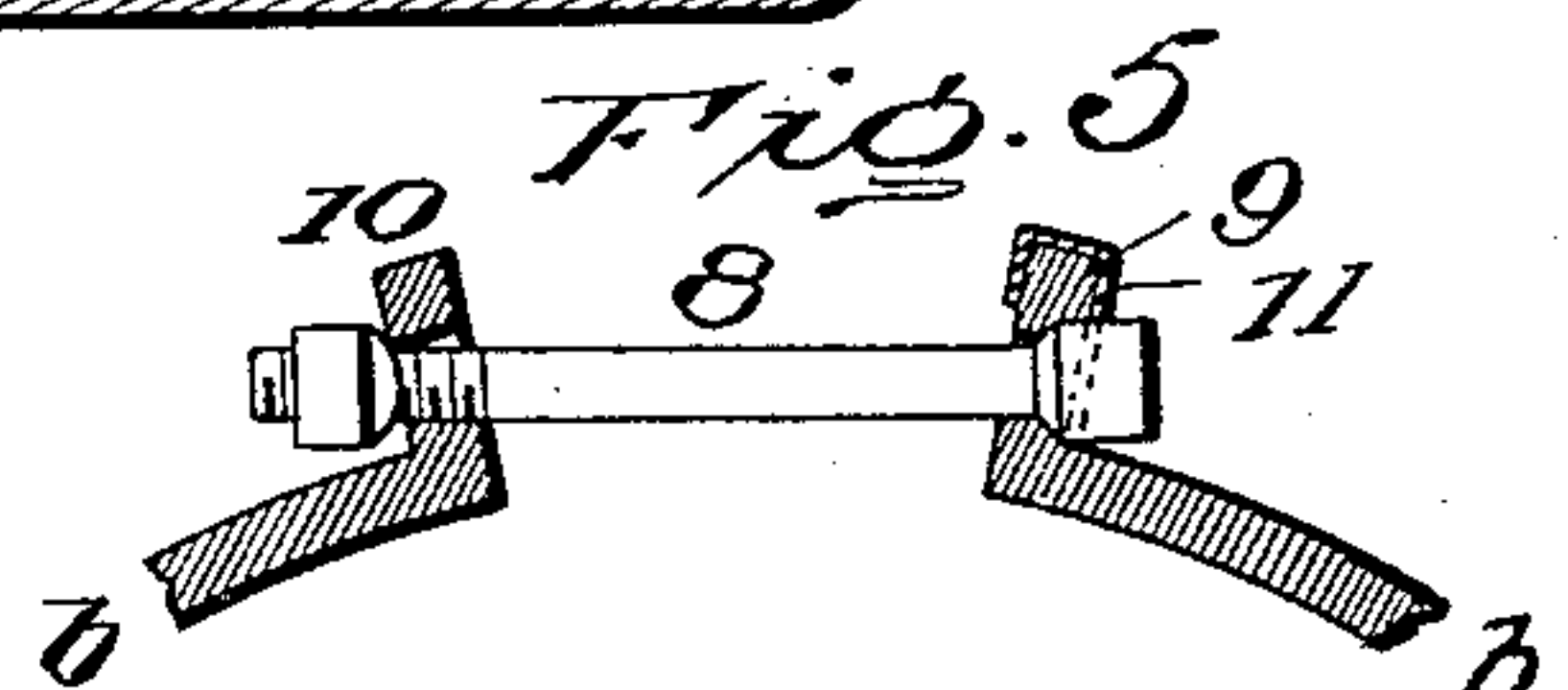
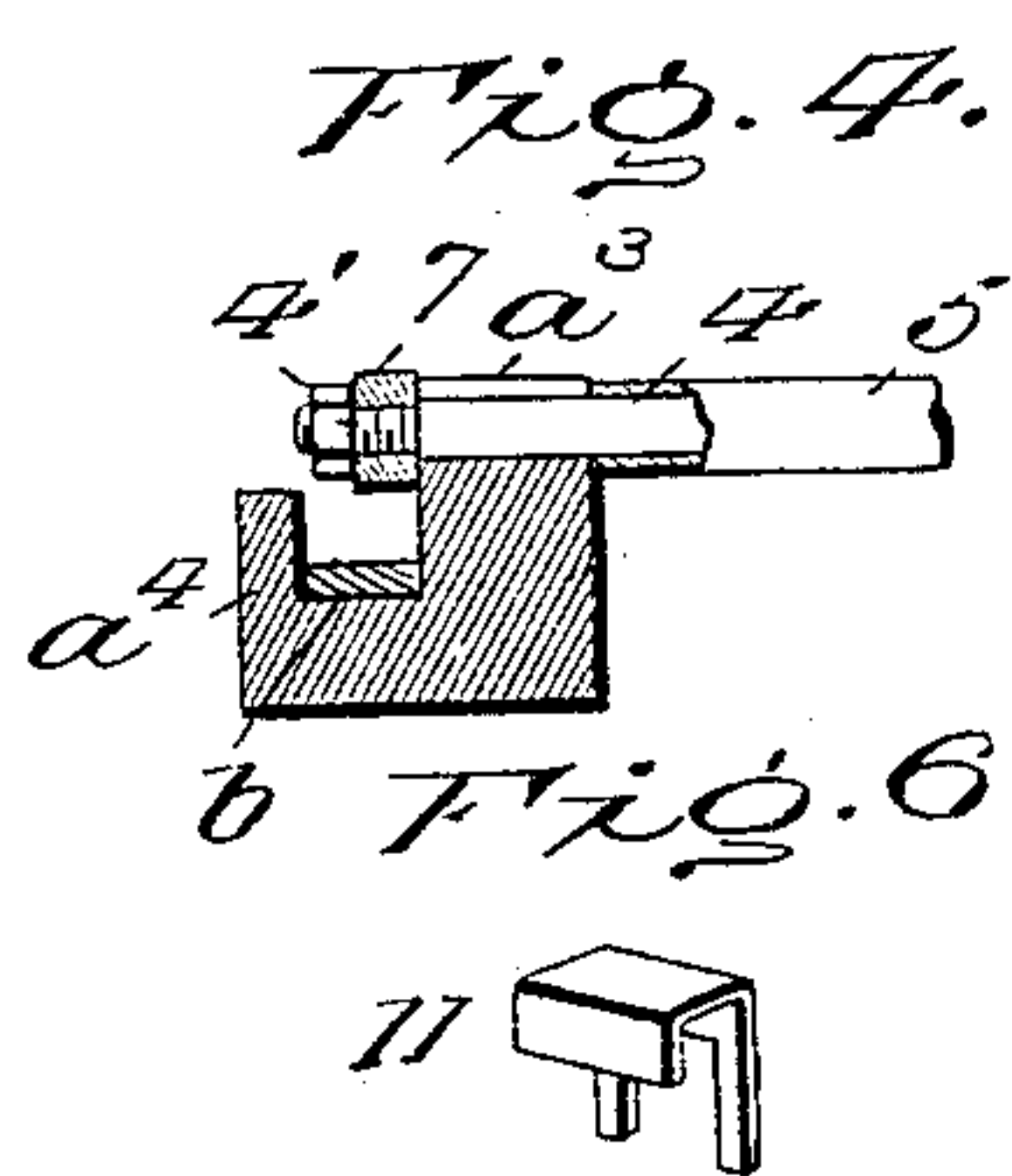
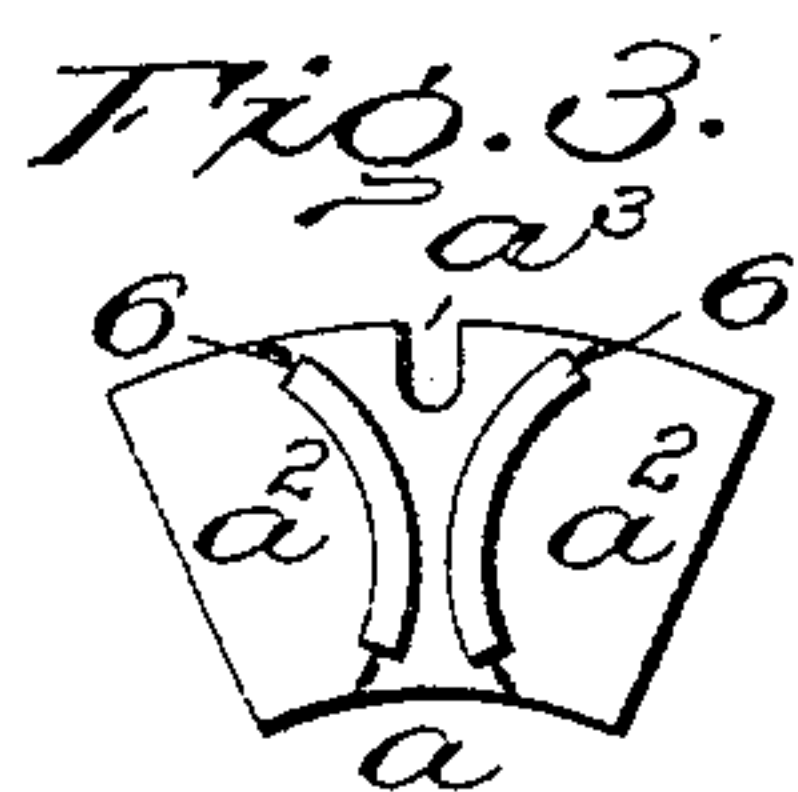
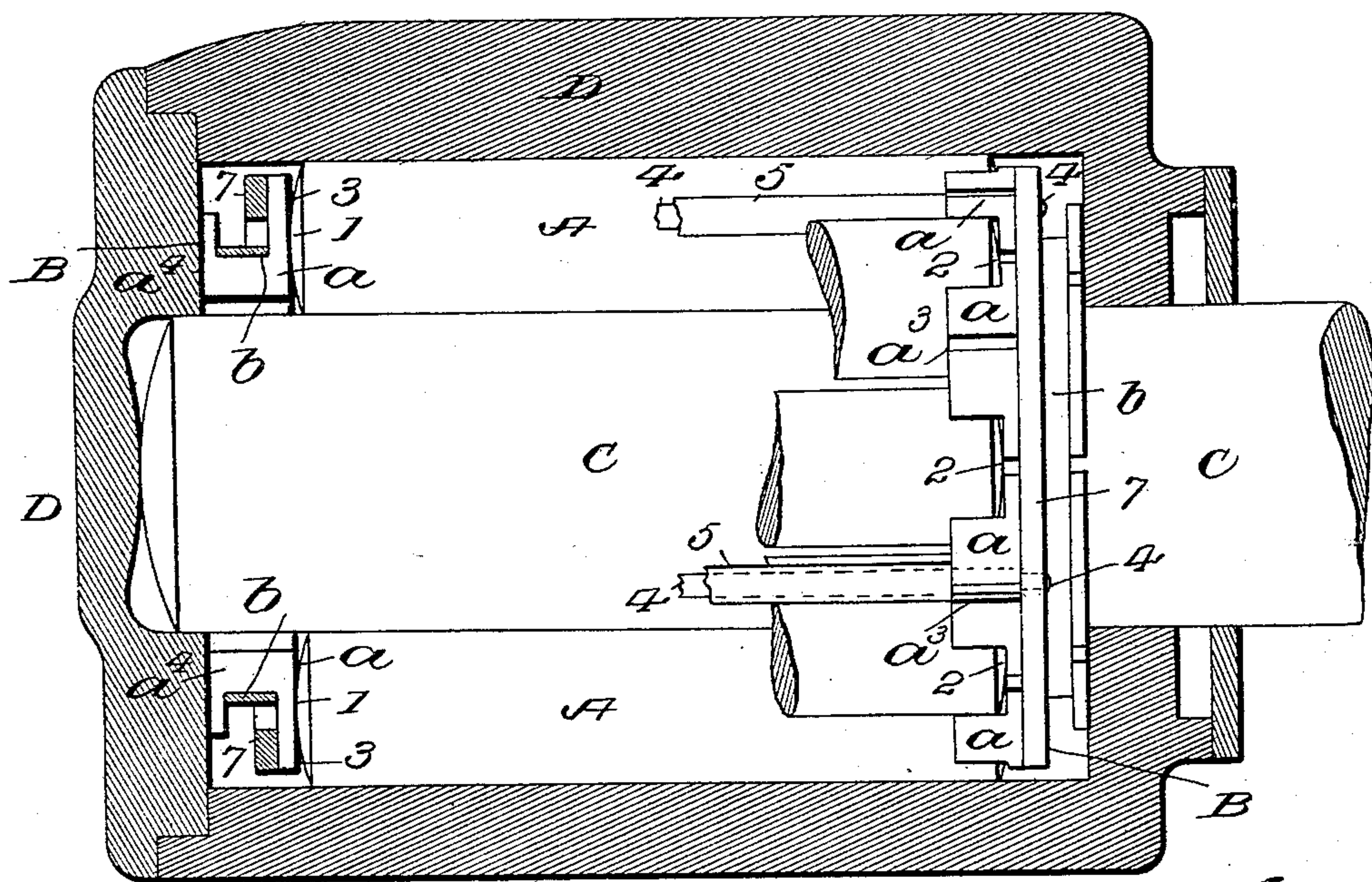
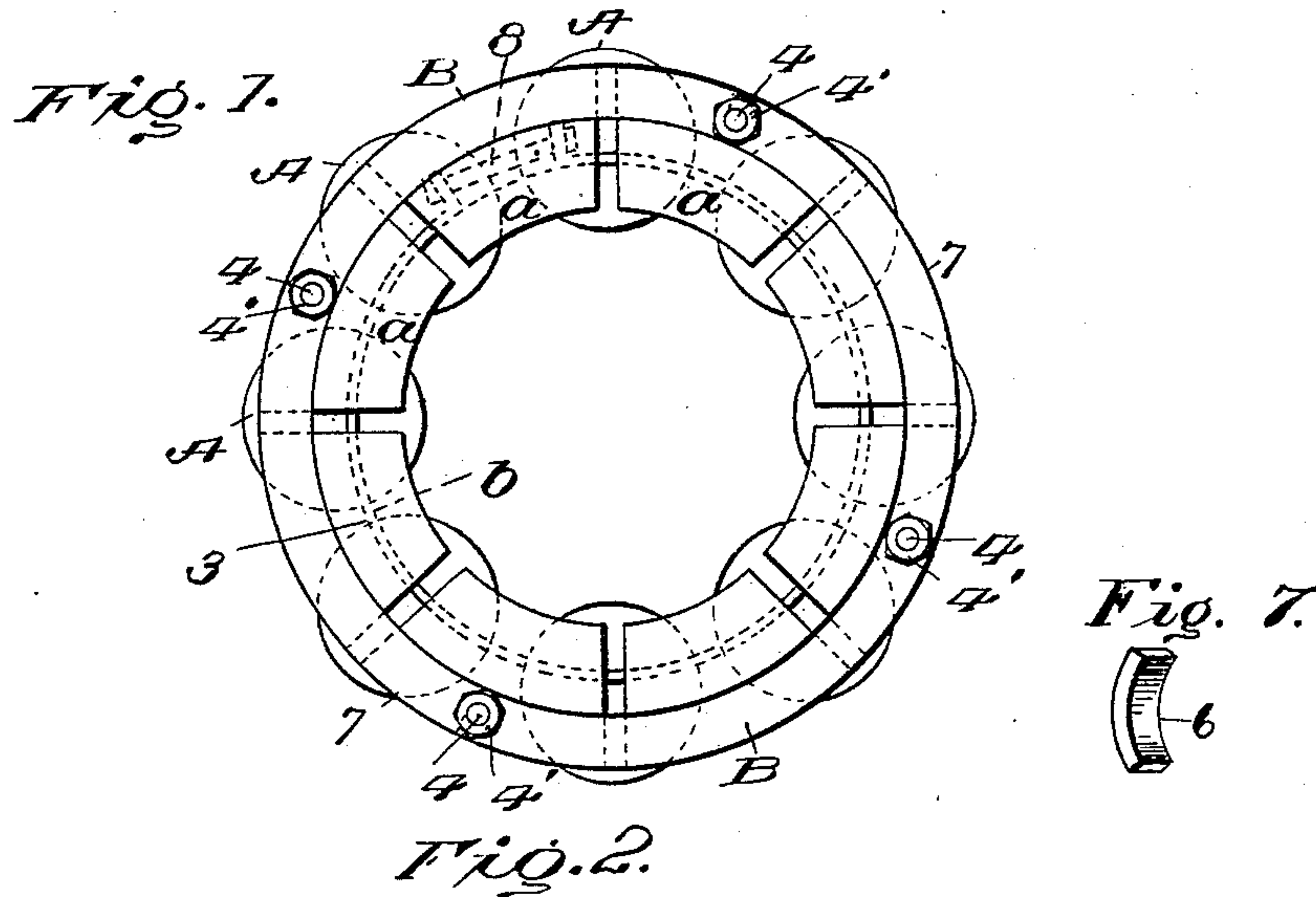
Patented Sept. 12, 1899.

W. J. BREWER.

MEANS FOR REDUCING FRICTION OF AXLES AND JOURNALS.

(Application filed May 8, 1899.)

(No Model.)



Witnesses

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Fig. 6

William John Brewer

per [Signature]

Attorney.



# UNITED STATES PATENT OFFICE.

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## MEANS FOR REDUCING FRICTION OF AXLES AND JOURNALS.

SPECIFICATION forming part of Letters Patent No. 632,693, dated September 12, 1899.

Application filed May 8, 1899. Serial No. 715,981. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM J. BREWER, C. E., a subject of the Queen of Great Britain and Ireland, and a resident of the city of London, England, have invented a new and useful Improvement in Means for the Reduction of Friction of Axles and Journals, of which the following is a specification.

This invention relates to the reduction of the friction of axles and journals—such as the axles of cabs and like vehicles, those of railway and tramway rolling-stock, engine and propellershafts, ships' pulleys, and other hoisting blocks, and the like.

The invention, in common with others of a series having the same title, consists in improved means for cradling antifriction-rollers, whereby those of a given roller-bearing for any axle or journal to which the same may be applicable are adapted not only to be removed and handled, together with their revolving cradle, as one piece, but are rendered capable of being adjusted at any time to take up wear and insure true and frictionless motion, the improved bearings being further provided with interchangeable wear parts that can be quickly and inexpensively replaced by new parts when the limit of adjustment is reached.

The present invention consists, further, in other novel combinations of parts in the improved roller-bearing, as hereinafter described and claimed.

A sheet of drawings accompanies this specification as part thereof.

Figure 1 of these drawings is an end view of an improved roller-bearing cradle with its complement of rollers, and Fig. 2 represents a longitudinal section through a car-axle box containing said improved cradle, portions of the latter being broken away to show its construction. Figs. 3 to 7, inclusive, are detail views and show, respectively, a face view of a cradle-section detached, a fragmentary longitudinal section in the plane of one of the tie-rods of the cradle, a sectional view of the contracting device of one of the cradle-contracting bands enlarged one diameter, a perspective view of the bolt-holder of said contracting device, and a perspective view of one of the renewable wear parts detached.

Like letters and numbers refer to like parts in all the figures.

In carrying this invention into effect I employ longitudinal antifriction-rollers A, that may be and preferably are of the simplest form—that is to say, without end pivots, or, in other words, shoulderless, but preferably constructed with convex ends 1 and 2 to limit contact at these points. A sufficient number of these rollers are assembled in a cradle B, composed generally of a pair of end rings 3 and longitudinal tie-rods 4, with sleeve-tubes 5 for rigidly uniting said end rings at a substantially fixed distance apart. Each of said end rings 3 comprises a number of interchangeable ring-sections  $a$ , one of which is shown detached by Fig. 3, each ring-section forming parts of two adjacent roller-sockets  $a^2$ , that are bisected radially by the open joints between the ring-sections and are provided with laterally-inserted wear parts 6, Figs. 3, 4, and 7, that are interchangeably renewable. Each ring-section is further constructed with a central notch  $a^3$ , Fig. 3, and with a circumferentially-grooved hub-portion  $a^4$ , Fig. 4. Said notch  $a^3$  of each alternate ring-section, as shown in Figs. 1 and 2, admits, as in Fig. 4, one of said rods 4 to engage with a flat ring 7, common to all, in contact with the backs of the ring-sections  $a$ , the sleeve-tube 5 on such rod coacting with the face of said ring-section, as in said Fig. 4. The hub portion  $a^4$  coacts with a contractible circumferential band  $b$ , Fig. 5, that separably unites the ring-sections of the end ring with each other and draws them more or less closely together and the wear parts 6 into more or less close contact with the several rollers. The proposed device for contracting said band  $b$  is best shown in Fig. 5. It consists of a screw-bolt 8 with a square or equivalent head and a screw-nut at its respective ends, both with convex inner surfaces, and perforated end lugs 9 and 10 on the band to coact, respectively, with said head and said nut of said bolt 8, as in Fig. 5. To facilitate tightening this device, a bolt-holder 11 (shown detached by Fig. 6) embraces the head of the bolt 8 by means of a notch in one of its ends, while its other end is hooked over the extremity of said lug 9, as in Fig. 5.



Both ends of the cradle B are preferably and conveniently alike, except that the rods 4 are preferably screwed into the ring 7 at the inner end of the cradle, while they are provided with screw-nuts 4' at the outer end.

The rollers A, as a whole, revolve around an axle or journal C, Fig. 2, in close contact with its periphery and with a concentric bearing-surface within its housing or box D, and the cradle B, Fig. 2, revolves therewith out of contact with the axle or journal and bearing in customary manner. The rollers and cradle when removed, as in Fig. 1, are united against accidental separation, so as to be handled as one part, and the cradle is thus exposed for adjustment or repair.

The principal wear occurs at the sides of the rollers A, within their sockets  $a^2$  in the cradle B. Such wear is localized, and the friction incident thereto is reduced to the minimum by the wear parts 6. As wear occurs, it is only necessary for a long time to tighten the bolts 8 occasionally, and thus draw the ring-sections  $a$  more closely together by means of the bands  $b$ . When the limit of such adjustment is reached, the wear parts 6 are removed and replaced by new ones, which practically renovates the bearing.

The extra first cost of the renewable wear parts and their appurtenances is largely compensated for by the fact that their use obviates machining the roller-sockets  $a^2$ , while the wear parts themselves are cast of Babbitt metal or the like and are finished and rendered interchangeable by their molds, so that the complement of a roller-bearing will cost only a few cents and the insertion of a new set will occupy only a few minutes and can be done by an unskilled mechanic.

For the purposes of this invention the axle or journal and its box or housing may be of any known or improved construction that admits of the use in connection therewith of longitudinal antifriction-rollers united in a revolving cradle. The dimensions of the rollers and cradle and the number of the rollers may vary to any required extent. The wear parts 6 may vary greatly in shape and size. By making the ring-sections of antifriction-bronze of sufficient strength the separate wear parts may be omitted, and other like modifications will suggest themselves to those skilled in the art.

I do not claim herein broadly a roller-bearing comprising longitudinal antifriction-rollers, a revolving cradle uniting said rollers and removable therewith, means for adjusting the rollers to take up wear, and renewable wear parts, but claim the same in a companion specification forming part of my application for patent filed May 3, 1899, Serial No. 715,447. My present improvement is confined to those embodiments of my means for the reduction of friction of axles and journals, in which the roller-cradle is made in sections with the

bearings of each roller bisected radially, so as to provide for taking up wear by a circumferential adjustment of the cradle.

Having thus described said improvement, I claim as my invention and desire to patent under this specification—

1. As improved means for reducing the friction of axles or journals, a set of longitudinal rollers in combination with a cradle uniting the same, adapted to revolve therewith, and comprising end ring-sections forming roller-sockets bisected by radial joints between said sections, and means for contracting the cradle to take up wear.

2. As improved means for reducing the friction of axles or journals, a set of shoulderless longitudinal rollers in combination with a cradle uniting the same, adapted to revolve therewith, and comprising end ring-sections forming roller-sockets bisected by radial joints between said sections, and means for contracting the cradle to take up wear.

3. As improved means for reducing the friction of axles or journals, a set of longitudinal rollers in combination with a cradle uniting the same, adapted to revolve therewith, and comprising end ring-sections forming roller-sockets bisected by radial joints between said sections and provided with renewable wear parts, and means for separably uniting said sections.

4. As improved means for reducing the friction of axles or journals, a set of longitudinal rollers in combination with a cradle uniting the same, adapted to revolve therewith, and comprising end ring-sections forming roller-sockets bisected by radial joints between said sections and provided with renewable and interchangeable wear parts, and means for separably uniting said sections.

5. In a roller-bearing, the combination with longitudinal rollers of a cradle comprising end ring-sections forming roller-sockets bisected by radial joints between said sections and constructed with circumferentially-grooved hub portions, contractible circumferential bands occupying such grooves, and means for contracting said bands to take up wear.

6. In a roller-bearing, the combination with longitudinal rollers of a cradle comprising end ring-sections forming roller-sockets bisected by radial joints between said sections and constructed with rod-admitting notches and circumferentially-grooved hub portions, tie-rods occupying said notches, rings external to the end rings engaged by said rods, contractible circumferential bands occupying said grooves, and means for contracting said bands to take up wear.

7. In a roller-bearing, the combination with longitudinal rollers of a cradle comprising end ring-sections forming roller-sockets bisected by radial joints between said sections and constructed with rod-admitting notches and circumferentially-grooved hub portions,



tie-rods occupying said notches, rings external to the end rings engaged by said rods, contractible circumferential bands occupying said grooves and having perforated end lugs, 5 screw-bolts coacting with said lugs to contract said bands to take up wear, and bolt-holders interlocking with the heads of said bolts and the contiguous lugs to facilitate adjustment, substantially as hereinbefore specified.

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Witnesses:

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